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Approved For Release 2000/04/17 : CIA-RDP78B04747A000100100001-9

10 November 1964

25X1A

MEMORANDUM FOR: [REDACTED], OSI/GSD/FEB

THROUGH : Assistant for Plans and Development, NPIC

SUBJECT : Evaluation of the Universal Stereophotogrammetric Instrument

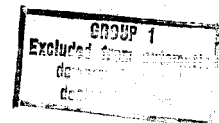
1. This memorandum is forwarded in response to your informal request of 25 September 1964 and contains additional information to that given to you during our telephone conversation on 16 October 1964.

2. The instrument described in this report is the Universal Stereophotogrammetric Instrument (158085), Class 42C. The author of the Soviet Article is F.V. Drobyshev. Sources of information are the English translation of Soviet Inventions Illustrated - June 1964 and three library file cards with a description and a photograph of the instrument. These references are attached to the report. The correlation of the English translation's instrument diagram and the diagram from the Russian text has been somewhat difficult, in addition the translation of the article does not mention some of the facts listed on the library reference cards. However, sufficient information was obtained from these sources and the Manual of Photogrammetry and Basic Metrical Photogrammetry by Duane Lyon to present this report.

3. The discussion which follows is an evaluation of the instrument's capability and an explanation of some of its operational principles. Photography used in any cartographic or photogrammetric instrument contains distortion which is inherent in the lens system of the camera and the taking perspective. When this distortion is considered detrimental to the accuracy requirements, it must be removed or reduced. There are a number of ways in which this can be accomplished. The Soviet instrument proposes distortion compensation through a series of linkages, transmissions and segmented carriages. In Western instruments of comparable accuracy, such as the Zeiss-Stereoplanigraph and Wild-Autograph, distortion compensation is accomplished by the use of aspheric correction plates at the object plane. The principle used by the Soviet Universal Stereophotogrammetric Instrument is a refinement of the Santoni mechanical correcting system (See Manual of Photogrammetry pg. 52, Second Edition, 1952). From all of the information available, the Soviet instrument

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and the Wild Autograph, A-7 are comparable in operation. Although the accuracy of the Soviet instrument is not stated, it is reasonable to assume that it is a first-order instrument, if the mechanical linkage and cardan transmissions are accurately machined and calibrated. Any deviation in mechanical tolerance could very easily place it in a second-order instrument category.

NOTE: First-order instruments provide high-resolving power in the observation of photographs and are capable of measuring elevations of ninety-percent of the vertical control points in a single model to at least aircraft altitude divided by 4000. Second-order instruments have reduced resolving power and accuracy.

The Universal Stereophotogrammetric Instrument, according to the information available, is not superior to other first-order instruments now being used or obtainable in the United States. In view of the research and development now being applied to automation of cartographic and photogrammetric procedures, present instruments may become obsolescent in the near future. The Helava - GMI Analytical Plotter is now being developed by Ottico Meccanica Italiana. This instrument automatically compensates for the previously operator-controlled parallax corrections, for lens distortions, earth's curvature and changes in scale due to relief features, through the use of appropriate servo mechanisms governed by an electronic computer. This instrument is designed as a first-order instrument.

4. It is hoped that this report has met your requirements. If there are any further questions concerning the instrument or its operation, please feel free to call upon us.

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Chief, Development Branch, P&DS

Attachment

Distribution:

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DATE REQUESTED BY _____ DATE RECEIVED BY _____ DATE APPROVED BY 5419
 ASSIGNED TO 25X1A Approved For Release 2000/04/17 : CIA-RDP78B04747A000100100001-9
 PROJECT ACTION 25X1A 12 Oct 64 150664

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1. Prepare memorandum outlining the U.S. state-of-the-art in photogrammetric instruments in comparison to the Soviet device described in the attached cards.

CONTRACTOR		CONTRACT NO	TYPE
CONSIGNEE		CLASSIFICATION	TOTAL COST
PROPOSAL RECEIVED	STAFF STUDY COMPLETED	SENT TO TDC	TDC ACTION
EX DIR APPROVAL 25X1A Approved For Release 2000/04/17 : CIA-RDP78B04747A000100100001-9	CONTRACT DATE	ESTIMATED COMPLETION	COMPLETION DATE
MONITOR 5419	PROJECT TITLE Photogrammetric Instruments (U.S.) (Soviet)		• Minor

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TO	NAME AND ADDRESS						DATE		INITIALS		
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6	[REDACTED] OSI, 5-T-37, last, please.										
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Remarks: It would be greatly appreciated if you would kindly let me know informally about the relative state of the art relative to the US, with regard to this universal photogrammetric device. Thank you for your efforts. <i>Completed 26 Nov 64</i>											
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25X1A FROM: NAME, ADDRESS AND PHONE NO.								DATE			
[REDACTED] OSI/SSD/FEB 5-T-37 x 5011								26 SEP 1964			
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